



Water Services, Inc.
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PROJECT: Pacific Rim Constructors
Waste Treatment in Panama

Client Project #: Mina de Cobre – Gap Camp T-9026
WSI Project #: WSI-1415

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Company: Pacific Rim Constructors

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Design Parameters & Assumptions:

Proposed Solution

Assumed BOD: 400 mg/l

Assumed TSS: 200 mg/l

Sewage Treatment Unit - 90,850 Liters per day (24,000 GPD) waste treatment unit housed inside a 40' ISO Open Top container, includes interior Steel piping and fittings, Vacuum Bubble Technology aerators aerators, tanks, Post Treatment; UV disinfection as outlined in attached flow chart

Total daily flow **90,850 Liters per day (24,000 GPD)**

Location Panama

2 EA - ~90,850 Liters per day (24,000 GPD)

2 EA - UV Disinfection

Pretreatment by screening oversized solids and non-organic debris. Followed by aeration supplied by [2] Vacuum Bubble Generators, submersible pump, in settling, aeration, sedimentation and anoxic chambers. Post treatment by UV, suitable for irrigation or surface, subsurface discharge [confirm with local authorities for up to date discharge standards]

Effluent/Treatment Parameters (based upon known and assumed parameters)

BOD after treatment < 10mg/l

Target BOD Standard < 20mg/l

TSS after treatment < 10mg/l

Target TSS Standard < 35mg/l

NOTES:

1. Gallons per day = 90,850 L/day X 0.26172 gal/L = 24,000 GPD
 2. Assume residential sewage at 400 mg/L.
 3. O₂ required = 24,000 gpd X 400 mg/L X 8.34/1,000 = ~83# BOD X 2 #O₂/#BOD = 166 # O₂
 4. Desired HRT = 1 days X 24,000 gpd = 24,000 gallon capacity + super saturation of oxygen 608 lbs of O₂ per day per VBT 601 = 1216 lbs of O₂ per day – BOD of 166 = 1050 lbs per day of bonus oxygen
 5. System requires 2 STP modules with 2 VBT 601 in first and 1 VBT 601 in the second aeration zone
 6. Two units provides 181,700L/day or 48,000 GPD capacity
- +A1



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